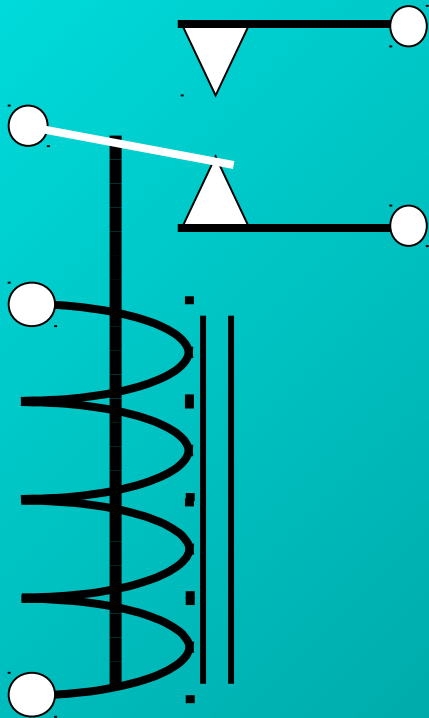


AC:

Relays & Switches



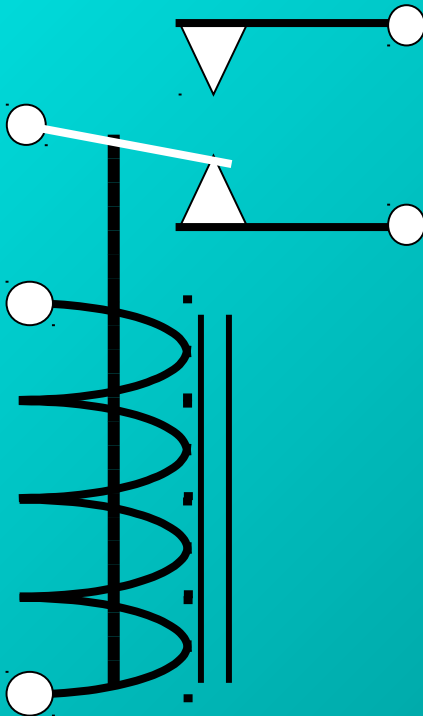
UNCLASSIFIED:

**Safety & Environmental Impact: “
LOW ”**

AC:

Relays & Switches

Terminal Learning Objective



ACTION:

by **Display proficiency in Ckt tracing**
& **recognizing, identifying switches**
operation. **relay symbols and circuit**

CONDITIONS:

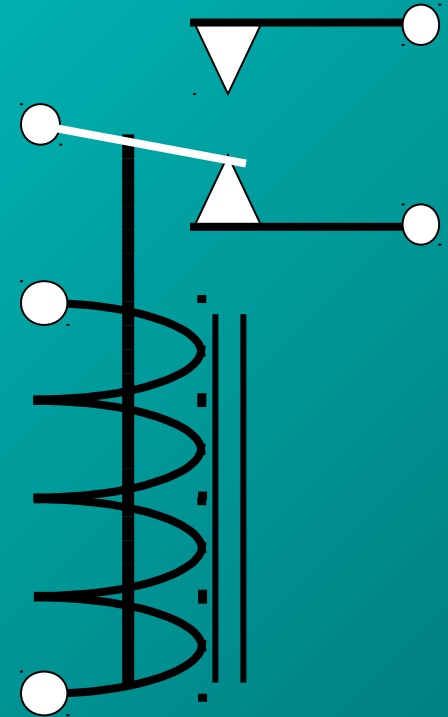
With Out reference.

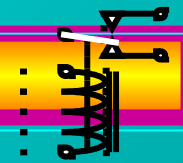
STANDARD:

of **A minimum 7 Correct answers out**
10 question.

Introduction

In this lesson the Electro Magnetic Relay & Various types of switches will be examined. These devices are commonly used in all electronics equipment





Electromagnetic Relay;

Used for the Routing of Voltage, Current, & Power.

With out Human exposure to high Voltages & Current.

with 1 Switch numerous switches can be Made.

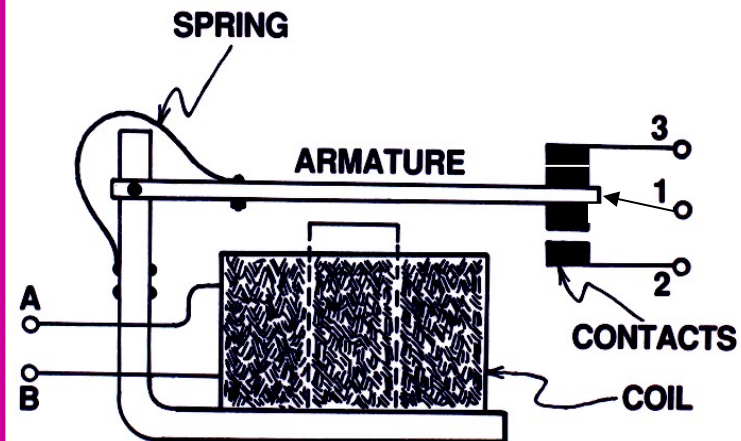
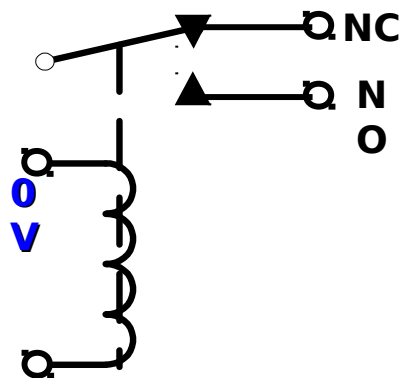
Power up procedures made in sequential order, thus eliminate possible Ckt damage or Human error.

Schematic
Symbols;

K_{1,2}

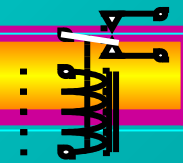
Note: ...

Relays normally
drawn De
Energized.



AC:

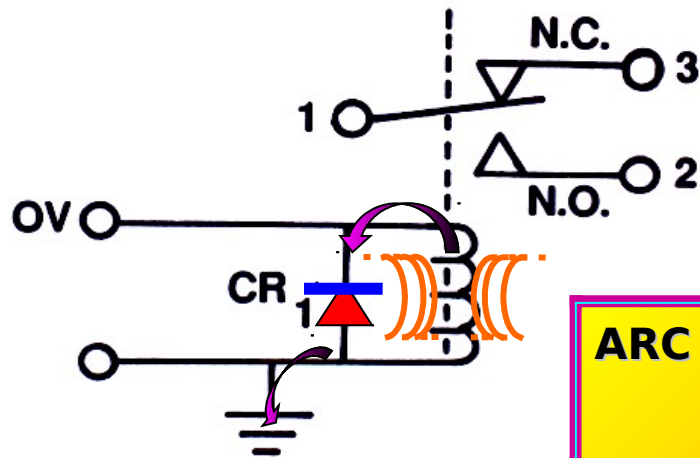
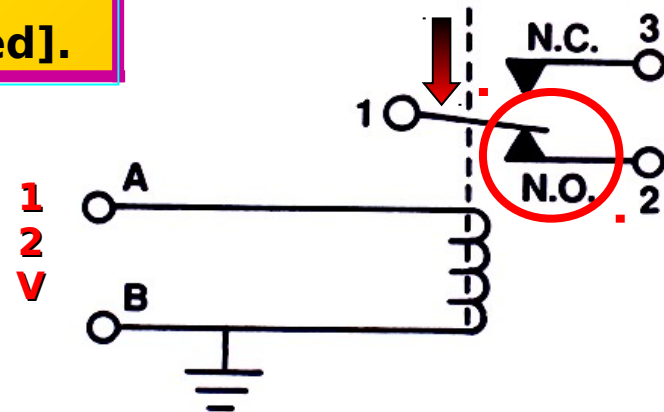
Relays & Switches



Electromagnetic Relay Energized;

12 Volts Energizes the coil.

Contacts 1 & 2 Make [Closed].



ARC Suppression Diode;

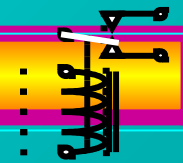
Coil Dennergized, Magnetic Field Collapses.

CR1 Forward Bias, Current shunted to Gnd.

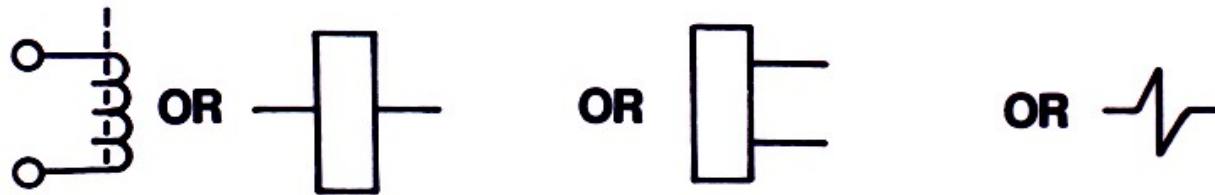
Symbol

AC:

Relays & Switches

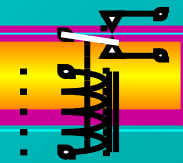


Electromagnetic Relay Symbols & Contacts;



AC:

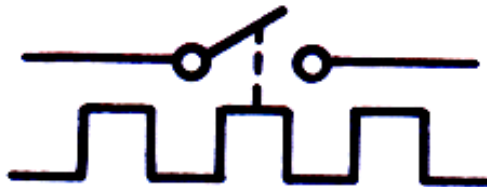
Relays & Switches



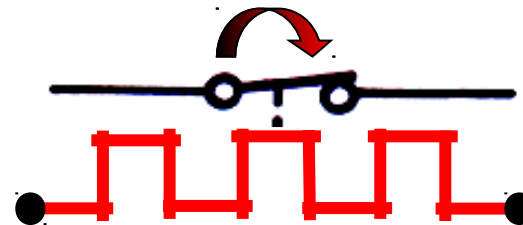
Time Delay [Thermal] Relay;

Contacts make at a predetermined temperature.

Provides for Ckt warm-up before full conduction or current flow.

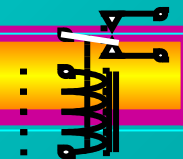


Denenergized



Energized

Switch



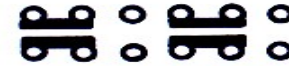
Switch Types;



**Interlock
Switch**



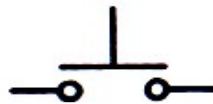
Slide Switch [SPDT]
Single Pole Double Throw



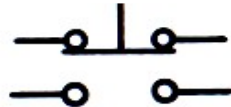
Slide Switch [4PDT]
4 Pole Double Throw



**LED, Light Emitting
Diode**



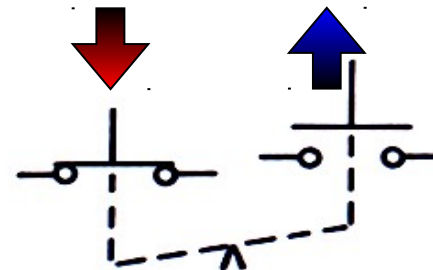
**Push to Make [PTM] Spring-
Return**



**Two Ckt Push to Break, Before
Make. Spring Return**



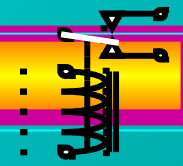
**Push to Break [PTB]
Spring-Return**



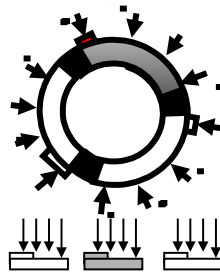
**Two Ckt Push to Make, Before Break.
Mechanical**

AC:

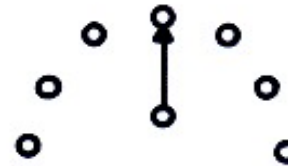
Relays & Switches



Switch Types;



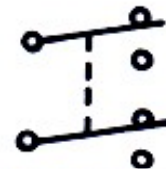
Rotary Switch



Selector Switch



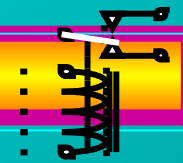
Toggle Switch, [SPDT] Single Pole Double Throw



Ganged- Switch, [DPDT] Double Pole Double Throw

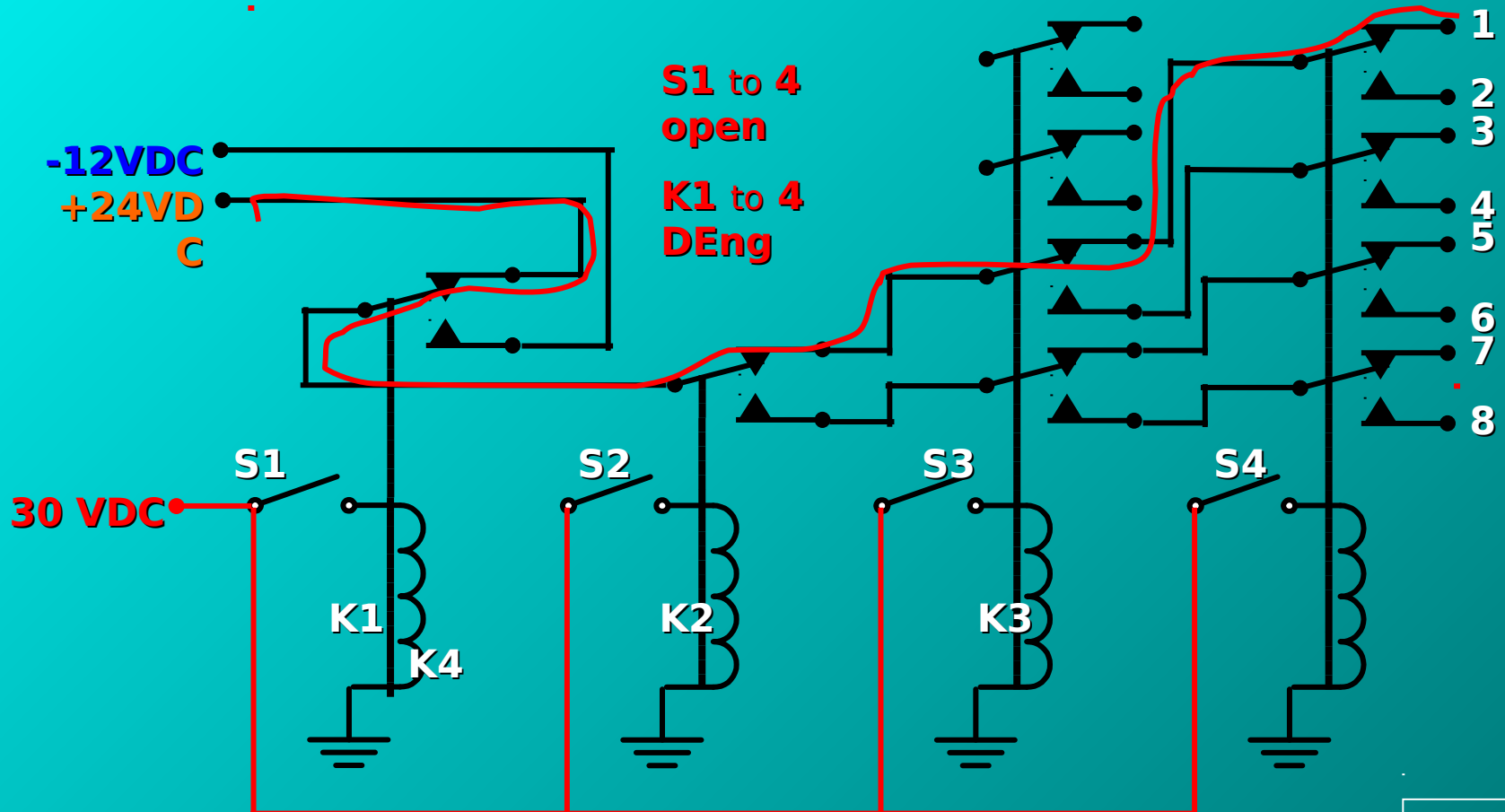
AC:

Relays & Switches



Relay Tree;

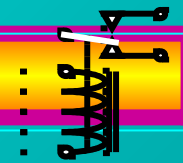
Trace the Ckt path to obtain **+24V** at Pin **1**. Indicate the switches that are closed & Relays that are energized.



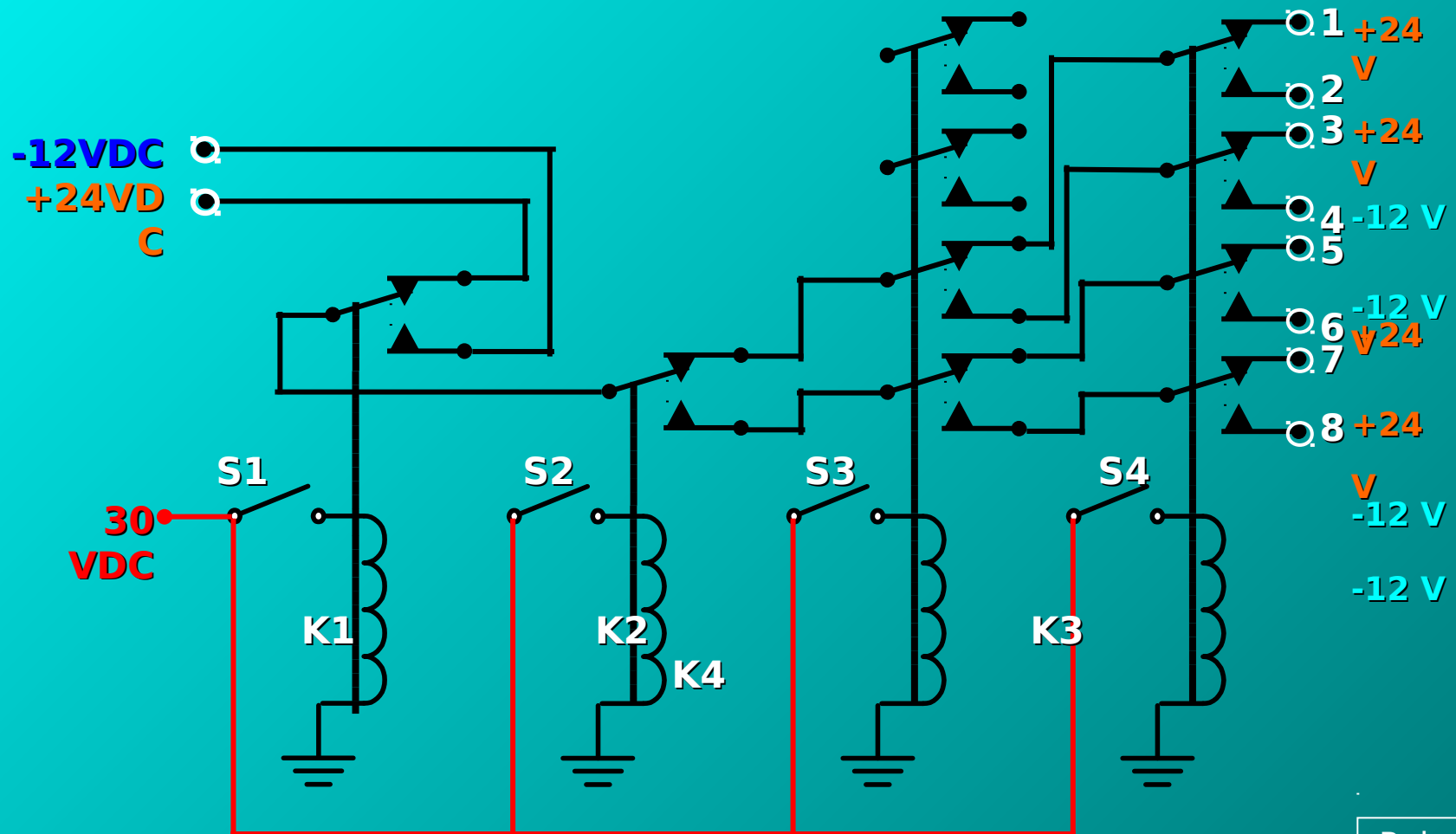
Challenge

AC:

Relays & Switches



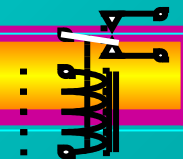
Relay Tree; Challenge



Relay
Tree

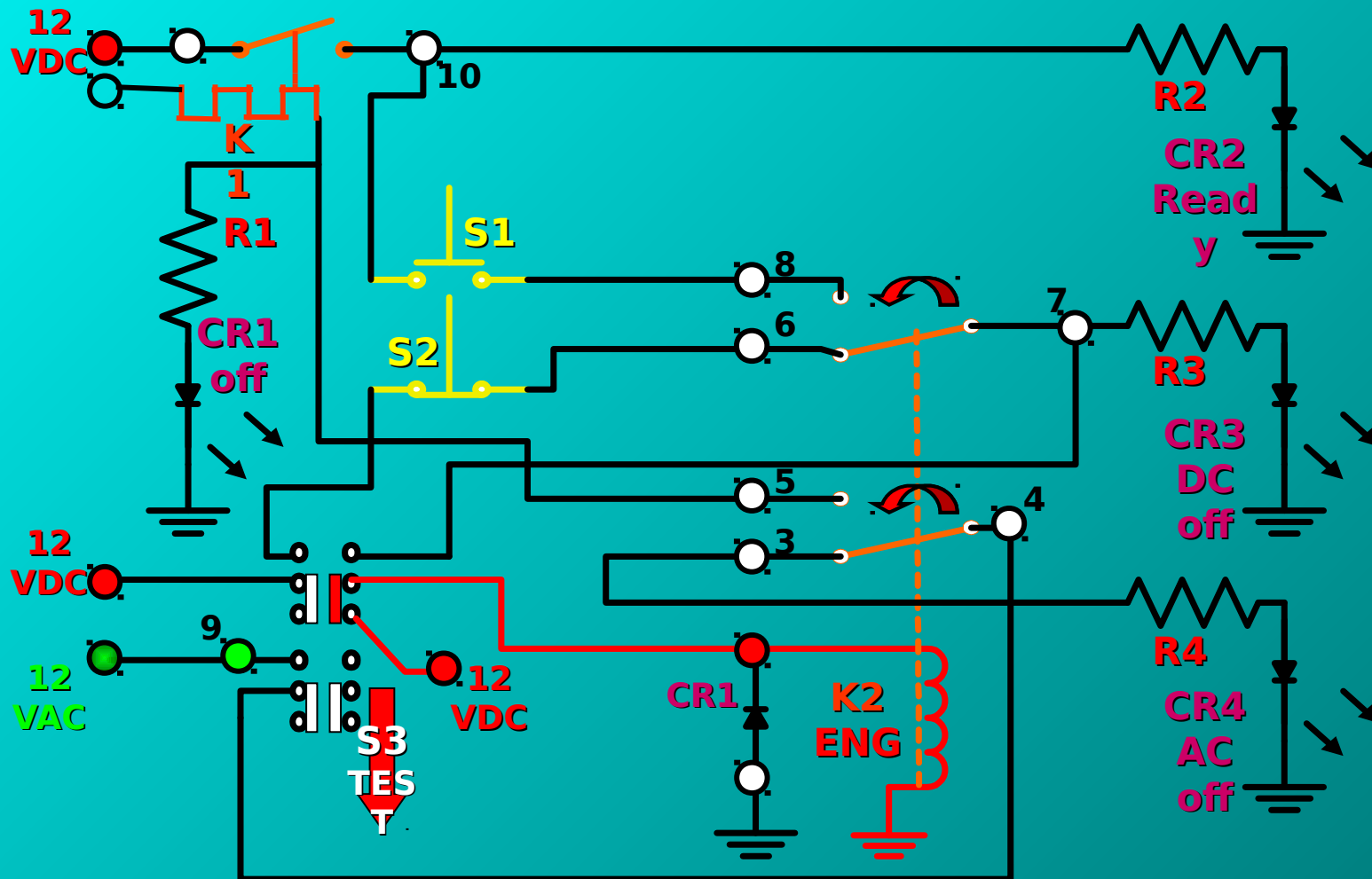
AC:

Relays & Switches



Control Device PC-130-71 ;

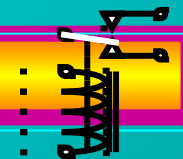
S3, Test Position.



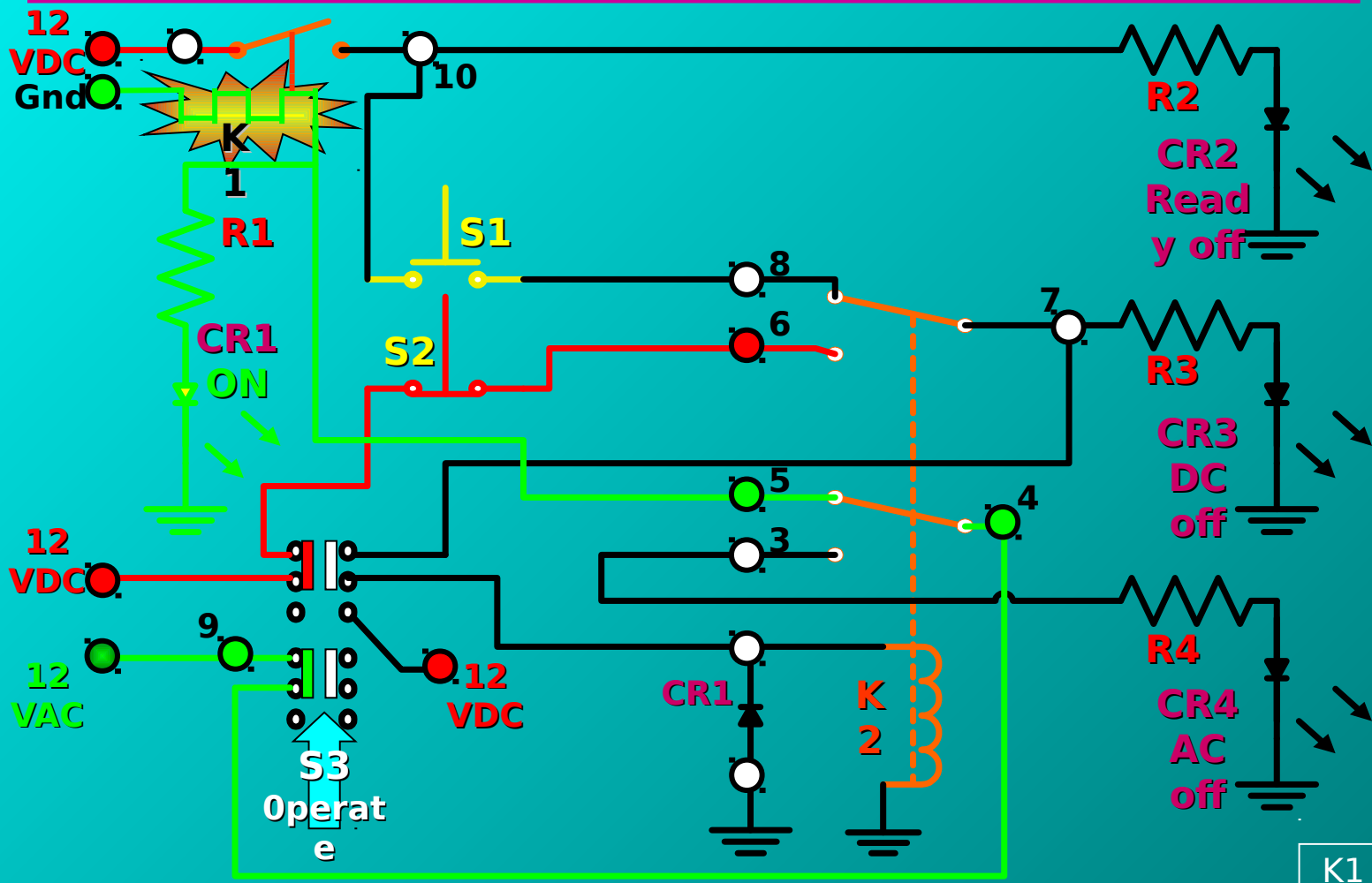
S3 Op

AC:

Relays & Switches



Control Device PC-71; S3, Operate Position, **AC** Applied.



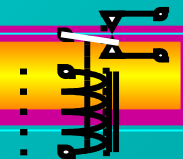
K1

Energized

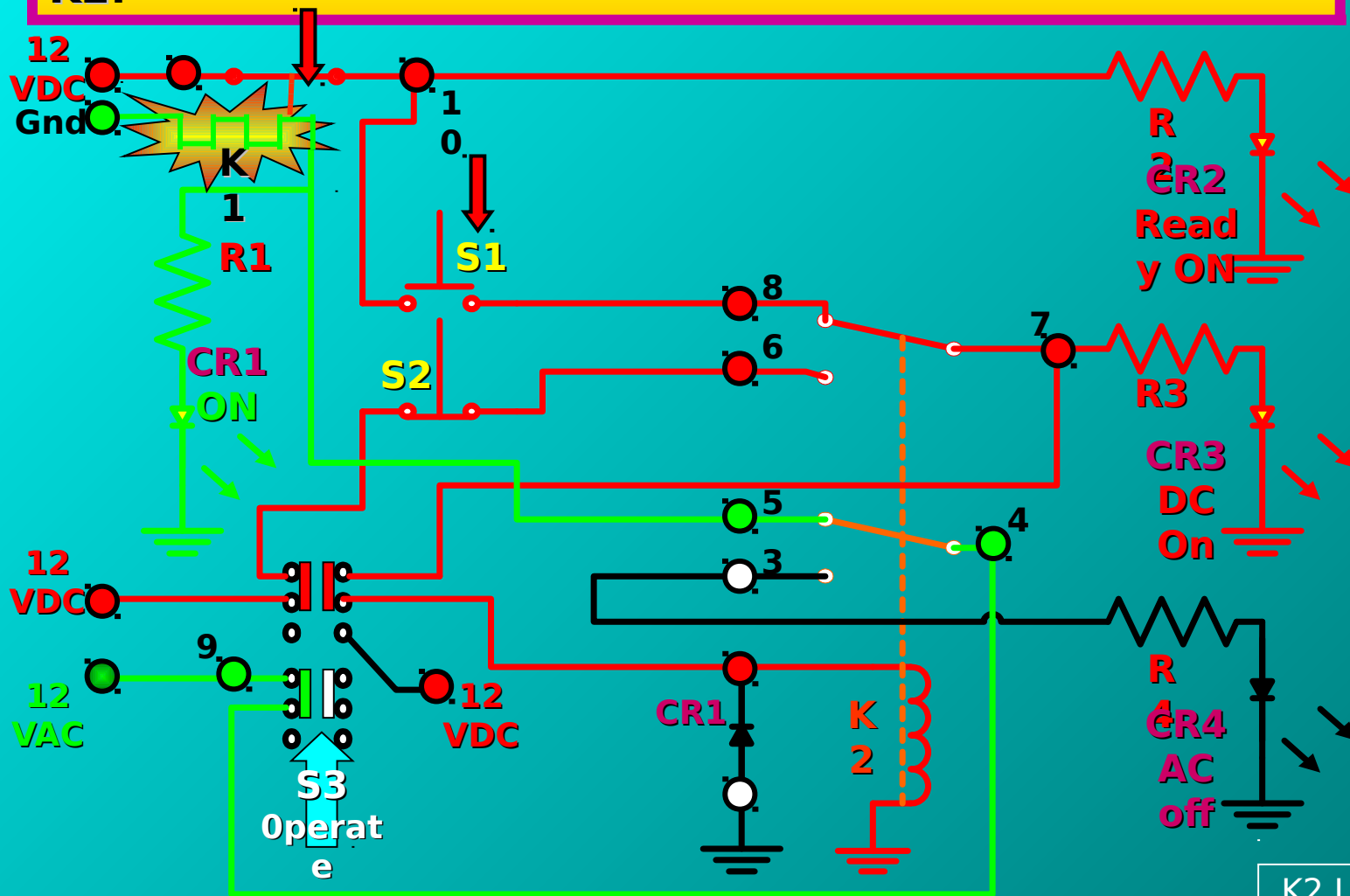
CF351 C11 - 13

AC:

Relays & Switches



Control Device PC-71; S3, Op Position, S1, Eng
K2.

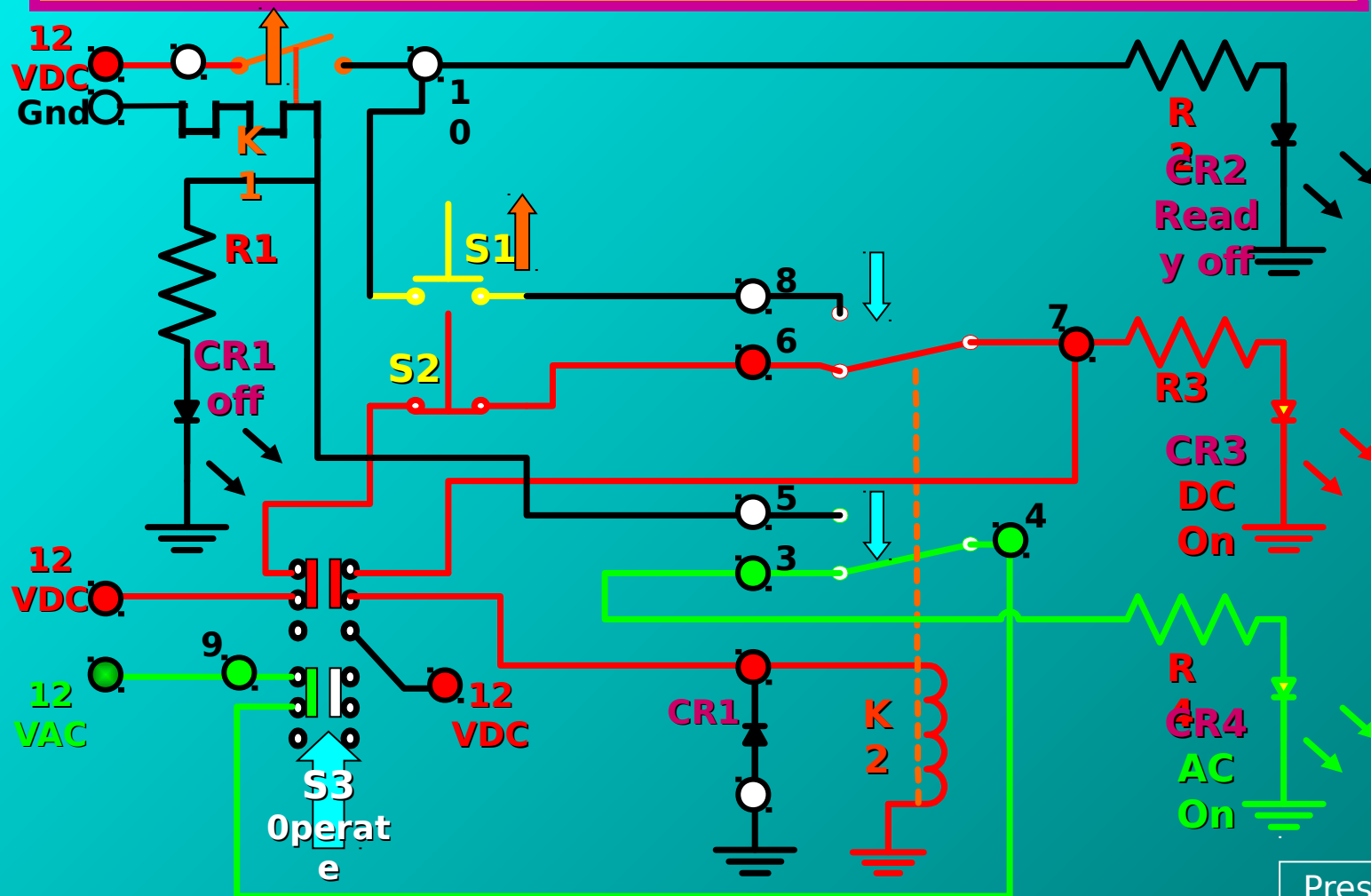


K2 Latched
On
CF351 C11 - 15

AC:

Relays & Switches

Control Device PC-71; S3, Op Position, K2 Latched ON.

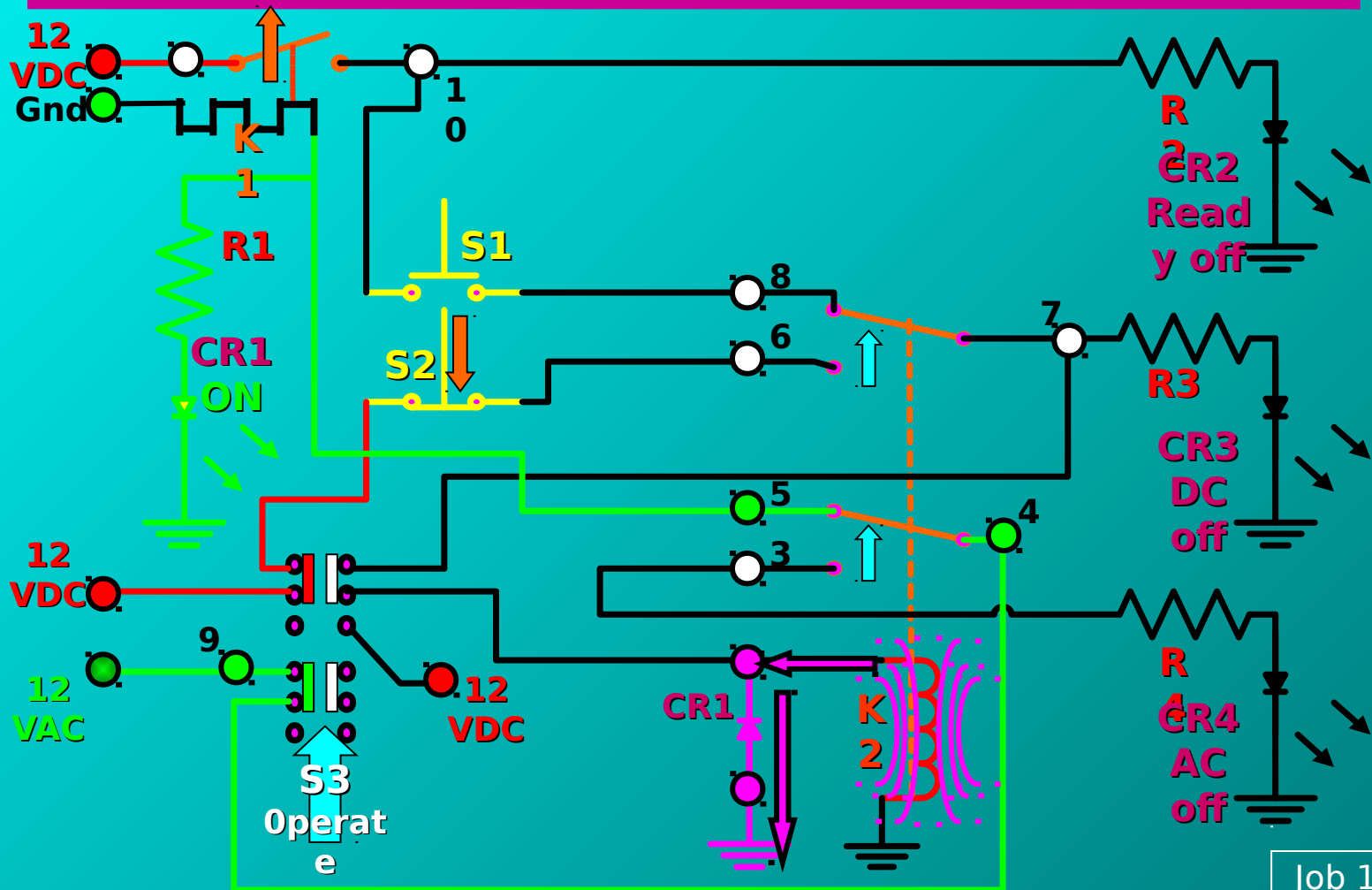


Press S2
DENG
CF351 C11 - 16

AC:

Relays & Switches

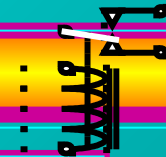
**Control Device PC-71; S3, Op Position, S2
Denergizer's K2**



Job 1:
Answers
CF351 C11 - 17

AC:

Relays & Switches



JOB 1; ID the Relays & Switches in Figures 1-14.

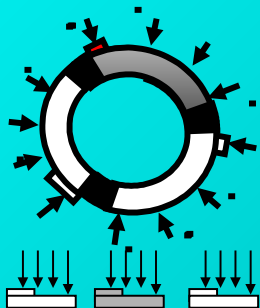


Figure 1

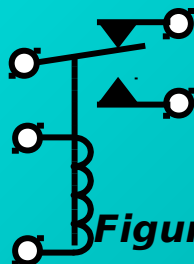


Figure 3

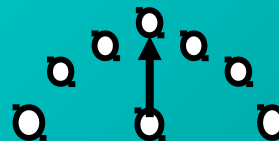


Figure 5



Figure 7

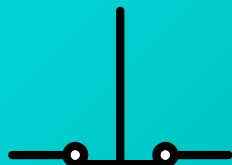


Figure 2

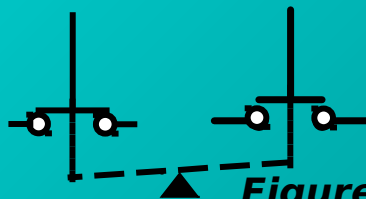


Figure 4

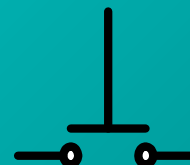


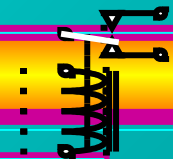
Figure 6



Figure 8

AC:

Relays & Switches



JOB 1; ID the Relays & Switches in Figures 1-14.

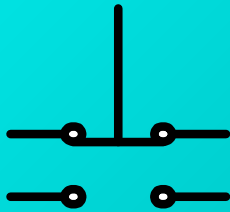


Figure 9

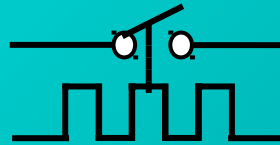


Figure 10



Figure 11

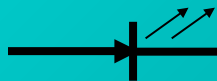


Figure 12



Figure 13

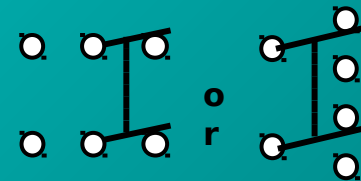
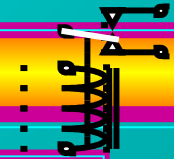


Figure 14

AC:

Relays & Switches



JOB 2; Refer to Fig 15 for Questions 1-10.

1. Which Switches are closed when + 15 V is present at pin 8.
2. Which Relays are energized when - 6 V is present at pin 4.
3. Which Relays are De-energized when +15 V is present at pin 2.
4. Which Relays are energized when - 6 V is present at pin 7.
5. Which Switches are closed when - 6 V is present at pin 1.

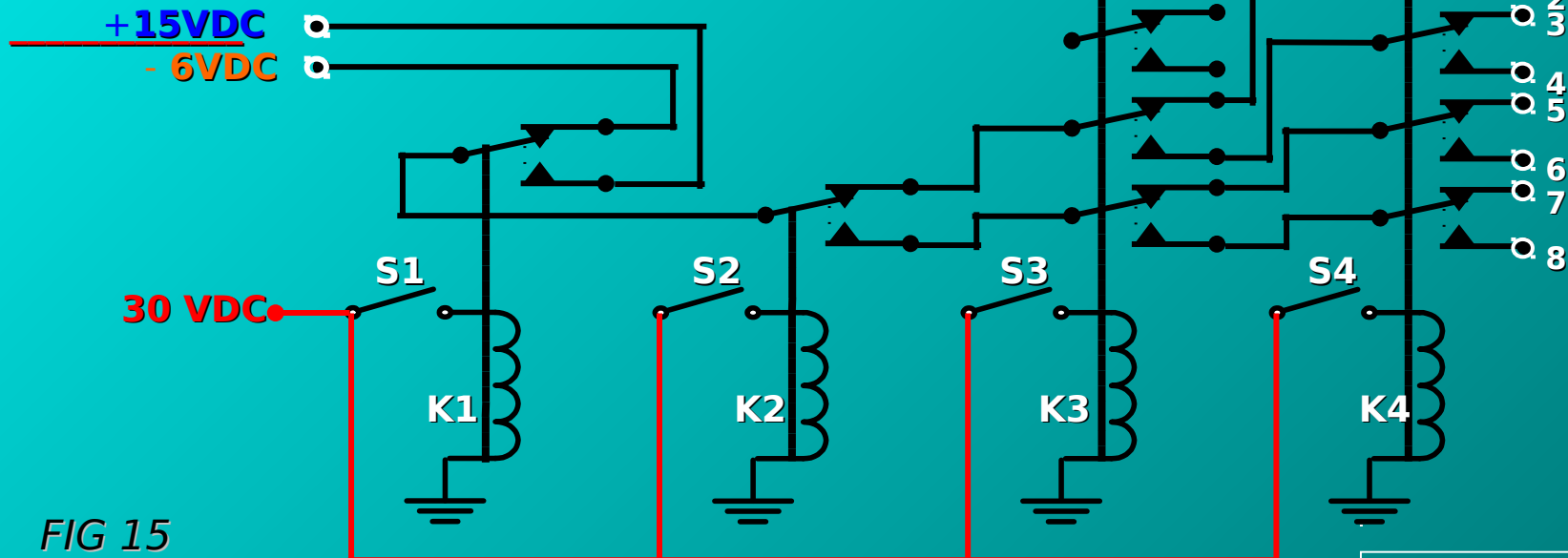
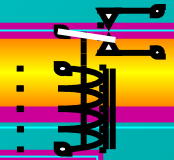


FIG 15

Job 2: Answers;
1-5

AC:

Relays & Switches



JOB 2; Refer to Fig 15 for Questions 1-10.

6. Which Relays are energized when +15 V is present at pin 3.

7. Which Relays are De-energized when +15 V is present at pin 7.

8. Which Switches are closed when - 6 V is present at pin 2.

9. Which Relays are De-energized when +15 V is present at pin 5.

10. Which Switches are Open when - 6 V is present at pin 6.

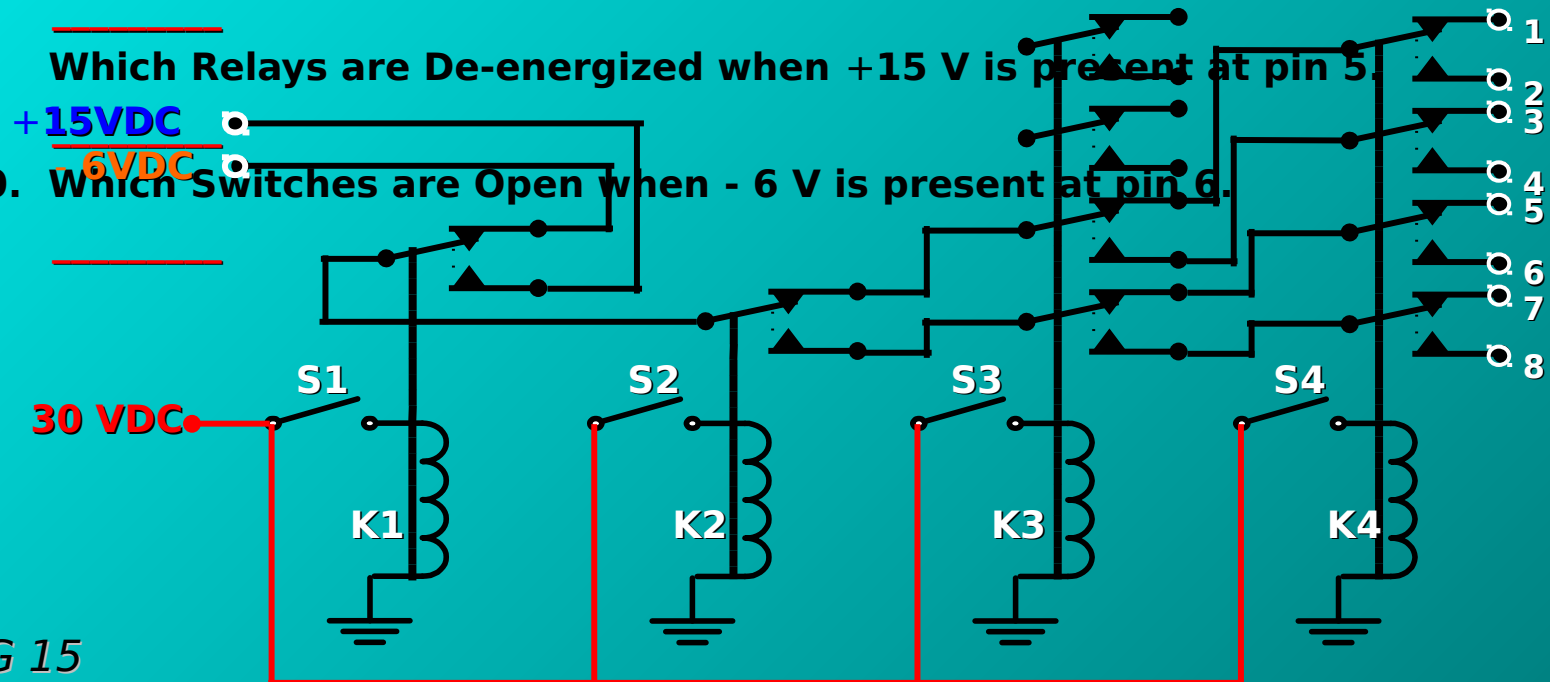
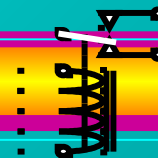


FIG 15

Job 2: Answers 15, 6-10

AC:

Relays & Switches



LESSON TEST:

Time; 20 Minutes.

References; W/O Reference.

**Standard; 7 of 10 questions
answered correctly.**

